

# (12) UK Patent Application (19) GB (11) 2 359 068 (13) A

(43) Date of A Publication 15.08.2001

(21) Application No 0002942.1

(22) Date of Filing 09.02.2000

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(51) INT CL<sup>7</sup>

B65D 47/24

(52) UK CL (Edition S )

B8T TWG T13A

(56) Documents Cited

US 5944235 A

US 5699933 A

US 5615808 A

US 5427271 A

US 5037015 A

US 4801053 A

(58) Field of Search

UK CL (Edition R ) B8T TWG TWQ , F1R RCB

INT CL<sup>7</sup> B65D 47/24

Online: EPODOC, WPI, JAPIO

(54) Abstract Title

**Bottle closure with push-button operated valve**

(57) A bottle closure 2 for a bottle 1 has a water outlet 21, closable by a self-closing valve 228, 229, 211 which is operated with a push-button 231. The button has a stem 231 which is arranged perpendicularly to the valve stem 226. When the button is pressed, a slanted end 234 of the button stem 231 presses upon a slanted surface 223 of the valve stem 226, thus moving it downwards thereby opening the valve. The button also has biasing means 233 which automatically returns the button to the released state when it is no longer pressed. The button stem 231 and the valve stem 226 are housed in chambers 22, 23 respectively, and the chambers join one another where the slant surfaces 223, 234 engage. The closure also has a bottle cap 3 with a cover portion 31, which is pivotally attached to the closure at a hinge 32, where there is also another biasing means 33. The closure is attached to the bottle neck by a screw-thread 11. There may be a seat 12 in the bottle neck against which rests against a flange 25 in the closure 2 when it is screwed on. The valve may consist of a seat 228 and a guide rod 226, and a seal 229 which rests against the edge of the valve opening 211 in the closed state. The valve may also have biasing means 227 which holds the valve closed when the button 231 is not pressed.

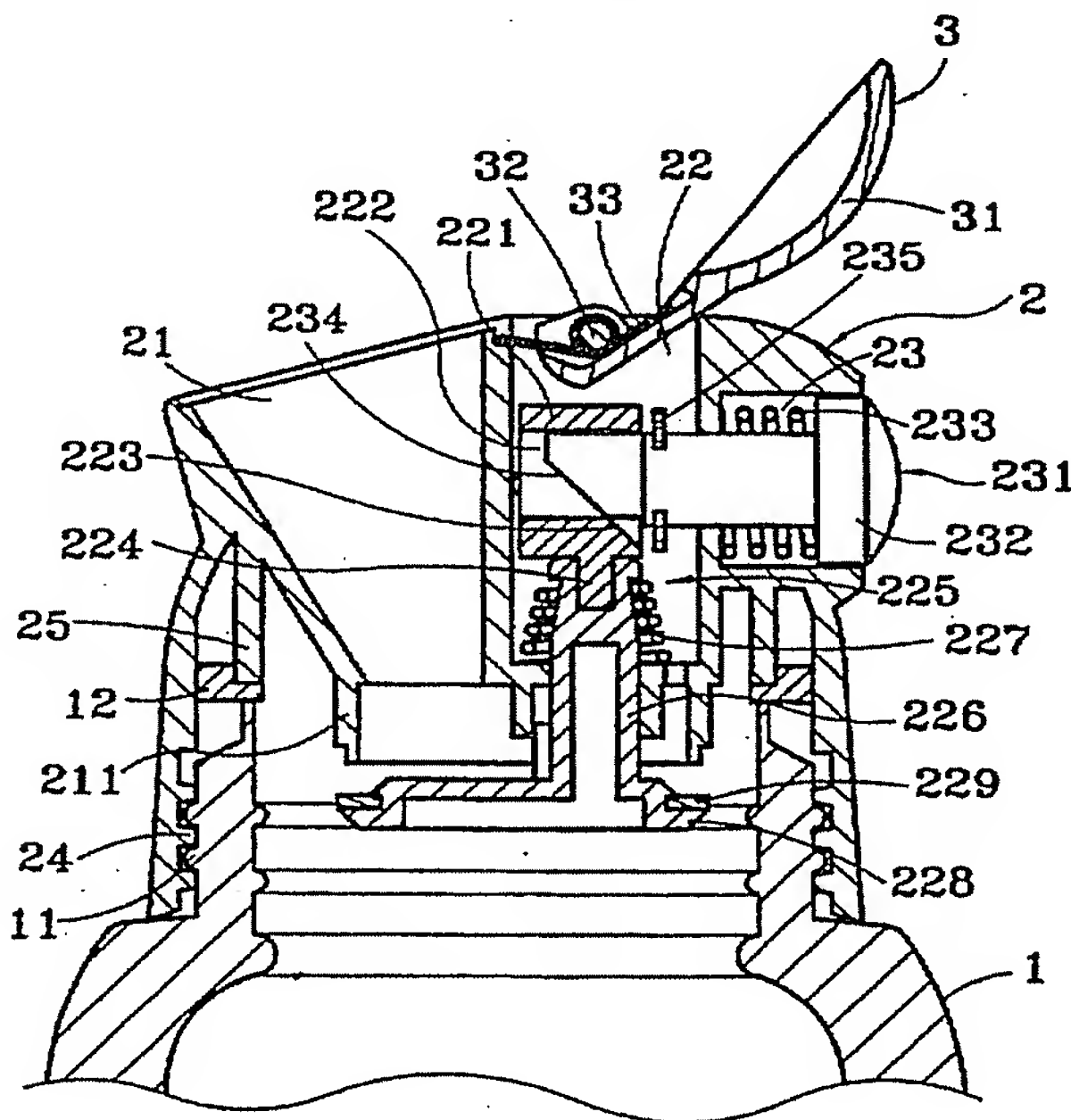


Fig. 3

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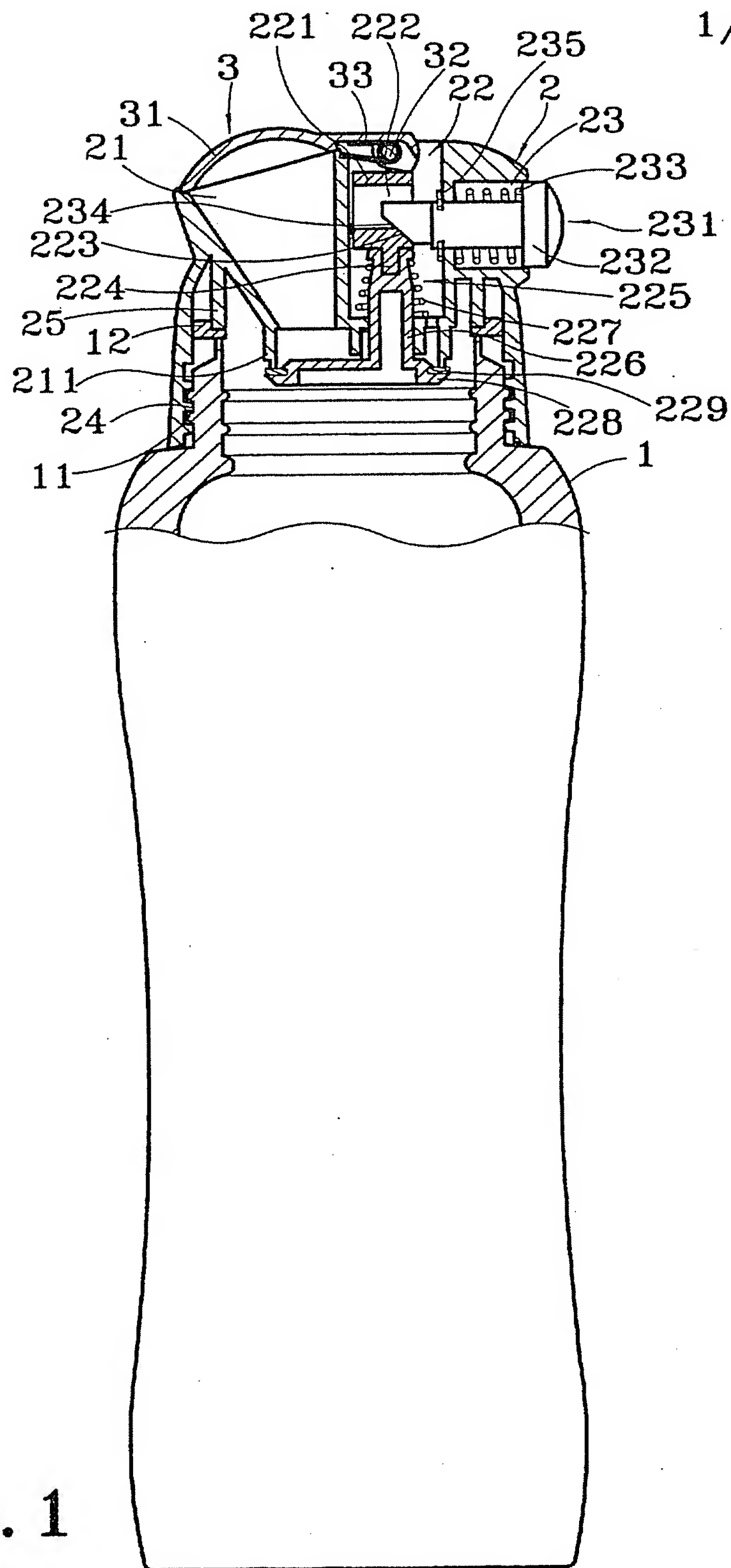


Fig. 1

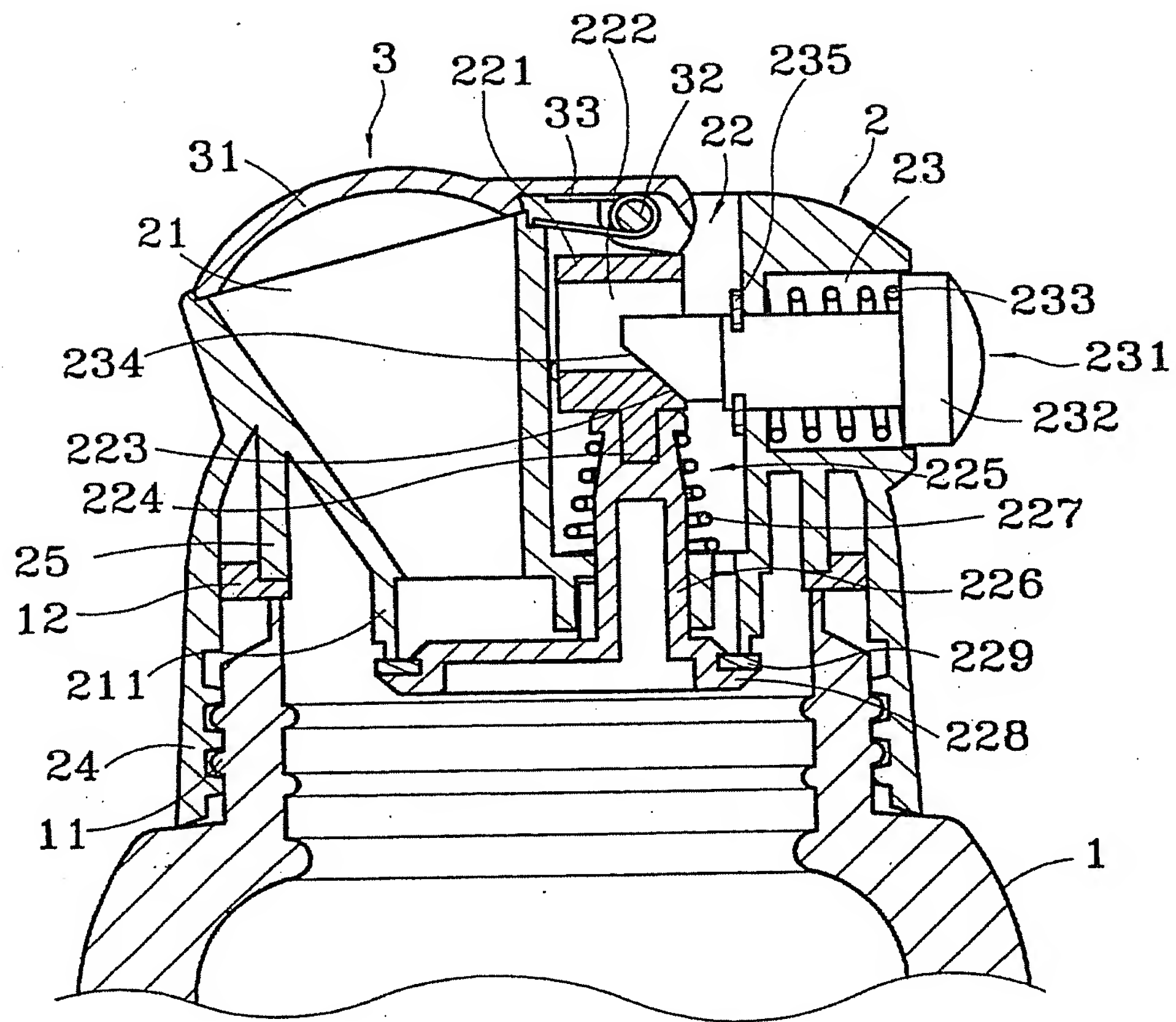


Fig. 2

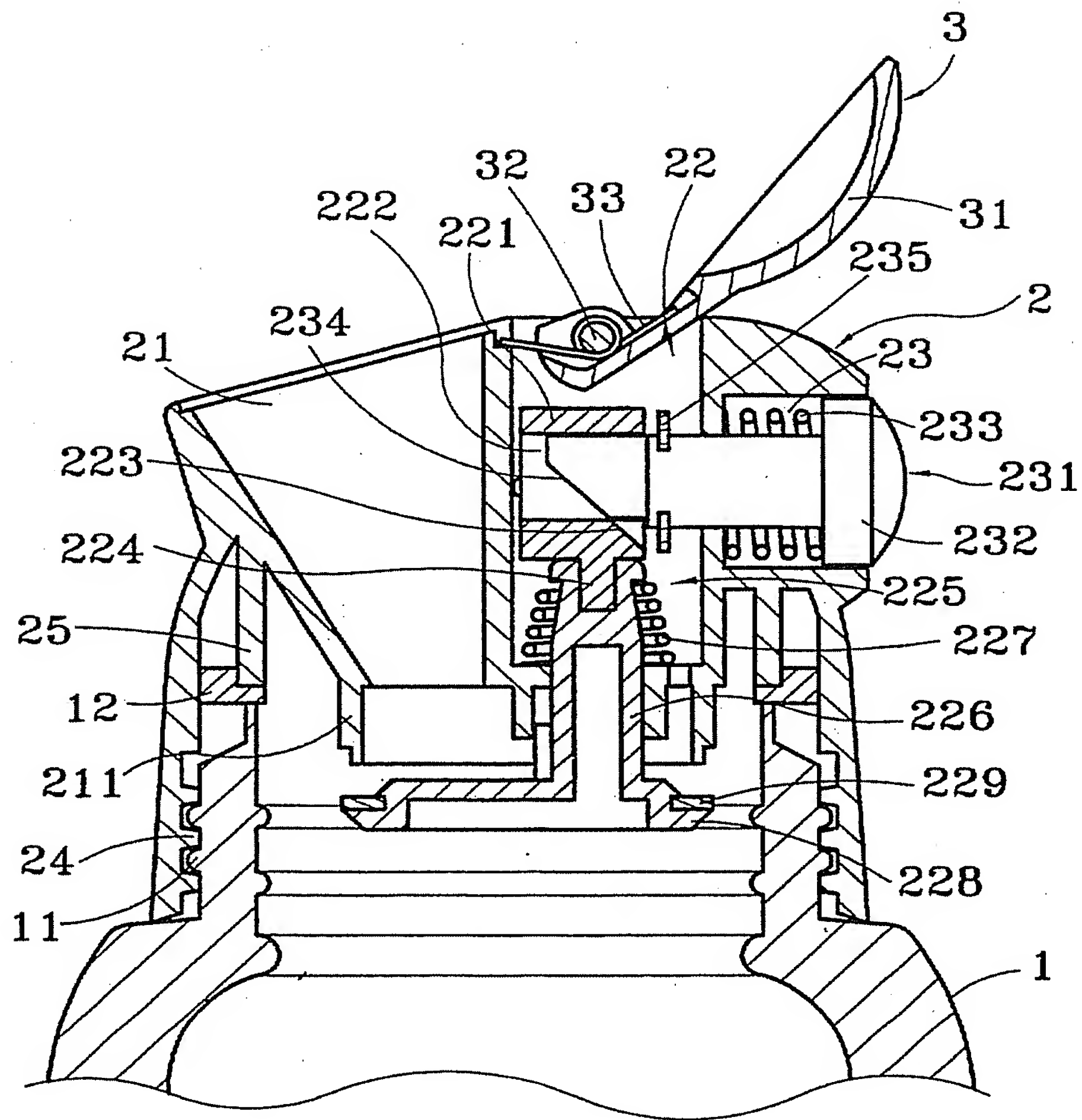


Fig. 3

## PUSH-BUTTON TYPE BOTTLE HEAD

This invention relates to a structure of bottle head, particularly to a leakage-proof push-button type bottle head for  
5 easy water supply.

A conventional bottle usually contains a bottle body and a cap. A user has to open the cap at first, then turn to loosen a bottle muzzle engaged with a threaded neck for pouring out the water in the bottle.

10 In turning to loosen the bottle muzzle, the user can hardly control the bottle muzzle to be loosened at a proper position so that the pouring rate is different every time to possibly get the user scalded with hot water. Another defect of such a design is that the water inside may flow out in a fall of the thermos bottle  
15 if the threaded neck and the bottle muzzle have not been screw-jointed tightly enough.

The primary object of this invention is to provide push-button type bottle head that the water inside can be poured out  
20 easily and the flow rate can be properly controlled.

Another object of this invention is to dispose in the bottle head a first elastic element with greater elastic force than that of a second elastic element so that the first elastic element will press upwards against a passive element to enable a gasket on a pan-  
25 like portion to attach closely to a bottom fringe of a water outlet

for prevention of water leakage.

The present invention will now be described by way of example with reference of the annexed drawings, in which:

5        Fig. 1 is a schematic view of an embodiment of this invention;

         Fig. 2 is a partially enlarged view of Fig. 1; and

         Fig. 3 is an action diagram of Fig. 2.

10        Referring to the various drawings attached herewith, a detailed description of the structural features of "PUSH-BUTTON TYPE BOTTLE HEAD" of the present invention is as follow:

         As shown in Fig. 1, a push-button type bottle head of this  
15        invention loaded onto a bottle body 1 to allow easy pouring of inside water and prevent water from leaking comprises a bottle head 2 and a bottle cap 3.

         The bottle head 2 disposed on the bottle body 1 is provided inside with a water outlet 21, which is adjacent to a first and a  
20        second mutually communicable storage chamber 22, 23, wherein a driven element 221 is arranged in the first storage chamber 22 while a through hole 222 is formed in the driven element 221; a slant bearing face 223 is arranged near the perimeter of the through hole 222. The driven element 221 is extended laterally to  
25        form a fix-and-joint portion 224 coupled with a passive element



225, which contains a guide rod 226. A first elastic element 227 is disposed between the guide rod 226 and the first storage chamber 22, wherein a pan-like portion 228 is disposed at one end of the guide rod 226, and a gasket 229 placed on the pan-like portion 228 is used to press against a bottom fringe 211 of the water outlet 21 exactly when the pan-like portion 228 is inactive. Moreover, the second storage chamber 23 is provided with an active element 231 extended to the first storage chamber 22, wherein a second elastic element 233 is located between a flange 232 of the active element 231 and the second storage chamber 23; the front end of the active element 231 is a slant driving face 234 standing in a conflict state against the bearing face 223. Furthermore, a confinement portion 235 is formed at a proper position of the active element 231 to prevent it from loosening and escaping. A threaded portion 24 formed on the inner surface of the bottle head 2 is screw-jointed with another threaded portion 11 located at the outer rim of the bottle body 1, and a stop-and-hold portion 25 is resided in the bottle head 2 for resisting against a stopper 12.

20 The bottle cap 3 having a sealing portion 31 for sealing the water outlet 21 is pivotally disposed on the bottle head 2, wherein the sealing portion 31 is extended to form a shaft-connecting portion 32 whereon a third elastic element 33 is located. By applying and assembling abovesaid elements or components, a bottle muzzle is completed and resided on the

bottle head 1.

As Fig. 2 and Fig. 3 indicate, after the bottle cap 3 on the bottle head 2 is opened, a user is supposed to apply force on the driving face 234 at the front end of the active element 231 to  
5 thereby drive the bearing face 223 of the driven element 221, namely, to press the driven element 221 downwards that will in turn drive the passive element 225, and at this moment, the pan-like portion 228 of the passive element 225 will depart from the bottom fringe 211 of the water outlet 21 to show an "open state"  
10 that allows the user to pour water out of the bottle body 1.

When the force is removed from the active element 231, the first elastic element 227 will push the driven element 221 upwards so that the passive element 225 is driven upwards too and the bearing face 223 of the driven element 221 is supposed to  
15 push the active element 231 back to its original position, and meanwhile, the pan-like portion 228 will press against the bottom fringe 211 of the water outlet to enter a sealed state again.

For the reason the elastic force of the first elastic element 227 is greater than that of the second elastic element 233, therefore, when the first elastic element 227 pushes the passive  
20 element 225 upwards, the gasket 229 of the pan-like portion 228 can attach intimately to the bottom fringe 211 of the water outlet 21 to thereby prevent water leakage of the bottle body 1.

Further, the water flow rate from the water outlet 21 may be  
25 controlled by adjusting the force applied on the active element



231 to thus change size of the open gap between the pan-like portion 228 and the bottom fringe 211 of the water outlet 21 so that an overflow or a scald is avoidable.

5 In the above described, at least one preferred embodiment has been elucidated with reference to drawings annexed, it is apparent that numerous variations or modifications may be made without departing from the true spirit and scope thereof, as set forth in the following claims.

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**I claim:**

1. A push-button type bottle head to be loaded onto a bottle body 1 to allow easy pouring of inside water and prevent water from leaking, comprising:

5       a bottle head 2 disposed on said bottle body 1, wherein said bottle head 2 is provided inside with a water outlet 21, which is adjacent to a first and a second mutually communicable storage chamber 22, 23; wherein a threaded portion 11 is formed on an outer surface around a bottle mouth of said bottle body 1;

10       a driven element 221 is arranged in said first storage chamber 22 while a through hole 222 is formed in said driven element 221; a slant bearing face 223 is arranged near a perimeter of said through hole 222, and said driven element 221 is extended laterally to form a fix-and-joint portion 224 coupled with a  
15       passive element 225; moreover, said second storage chamber 23 is provided with an active element 231 extended to said first storage chamber 22, wherein a second elastic element 233 is located between a flange 232 of said active element 231 and said second storage chamber 23, and a front end of said active  
20       element 231 is a slant driving face 234 standing in a conflict state against said bearing face 223; and wherein both said bearing face 223 and said driving face 234 are made slant;

25       a bottle cap 3 having a sealing portion 31, which is extended to form a shaft-connecting portion 32, whereon a third elastic element 33 is located;

whereby said active element 231 being supposed to push said driven element 221 downwards to drive said passive element 225 to become open for a user to pour water out of said bottle body 1 when said active element 231 is pressed by an external force; on the contrary, said second elastic element 233 being able to restore said active element 231 to its original position and said driven element 221 and said passive element 225 back to a "close state" when the external force is removed.

2. The push-button type bottle head of claim 1, wherein a stopper 12 is arranged on a bottle mouth of said bottle body 1.

3. The push-button type bottle head of claim 1 wherein said passive element 225 contains a guide rod 226; and a first elastic element 227 is disposed between said guide rod 226 and said first storage chamber 22; a pan-like portion 228 is disposed at one end of said guide rod 226, and a gasket 229 placed on said pan-like portion 228 is used to press against a bottom fringe 211 of said water outlet 21 exactly when the pan-like portion 228 is inactive.

4. The push-button type bottle head of claim 1, wherein a confinement portion 235 is provided to said active element 231.

5. The push-button type bottle head of claim 1, wherein a stop-and-hold portion 25 is resided in said bottle head 2 for resisting against a stopper 12.

6.A push-button type bottle head substantially as herein described and illustrated with reference to the accompanying drawings of Figures 1, 2 & 3.



Application No: GB 0002942.1

Examiner: Dr F a t e m a  
Sardharwala

Claims searched: 1-6

Date of search: 8 May 2000

**Patents Act 1977**  
**Search Report under Section 17**

**Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.R): B8T (TWG, TWQ), F1R (RCB)

Int Cl (Ed.7): B65D 47/24

Other: Online: EPODOC, WPI, JAPIO

**Documents considered to be relevant:**

| Category | Identity of document and relevant passage |   | Relevant to claims |
|----------|---|---|--------------------|
| X        | US 5944235                                | (WON) Fig. 6 and line 54 of column 4 to line 27 of column 5                       | 1, 3               |
| X        | US 5699933                                | (HO et al.) Fig. 3-5 and line 50 of column 2 to line 51 of column 3               | 1-5                |
| A        | US 5615808                                | (HUANG)   |                    |
| X        | US 5427271                                | (WANG) Fig 8 and 9 and lines 2-27 and 39-60 of column 2 and lines 1-3 of column 3 | 1, 3, 4            |
| A        | US 5037015                                | (COLLINS)   |                    |
| A        | US 4801053                                | (KASTER)  |                    |

X Document indicating lack of novelty or inventive step  
Y Document indicating lack of inventive step if combined with one or more other documents of same category.  
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